Claims:

1. A downhole pumping apparatus, comprising:

a wellbore having well fluids received therein from a formation into which said wellbore extends, said well fluid having a natural height within said wellbore and an interface between said well fluid and a second, lower density fluid, at a location spaced from the terminus of said wellbore;

a pump locatable within said wellbore and positioned intermediate said terminus and said interface; and

a cooling member located within said well.

2. The downhole pumping apparatus of claim 1, wherein said cooling member comprises a cooling zone located intermediate said pump and said terminus.

3. The downhole pumping apparatus of claim 2, wherein said cooling member further includes a pressure gradient in said well fluid.

4. The downhole pumping apparatus of claim 3, wherein said cooling zone further includes a saturated liquid in said well fluid, and vapor evolves from said liquid in said cooling zone as the liquid enters a region of the cooling zone that is at a lower pressure.

5. The downhole pumping apparatus of claim 4, wherein said evolving vapor cools the well fluid as it vaporizes.

6. The downhole pumping apparatus of claim 5, wherein said wellbore includes a footed wellbore having a section thereof having a generally horizontal component and a span extending between a lower surface of said wellbore and an upper portion of said wellbore;

said pump is positioned at the lower surface of said wellbore and a space is provided between said pump and said upper surface of said wellbore; and

said vaporizing gas naturally rises in said wellbore and through said space.

7. The downhole pumping apparatus of claim 6, wherein said pump is a progressing cavity pump including a stator therein, and said stator includes rubber.

8. The downhole pumping apparatus of claim 7, wherein said pump includes a rotor received within said stator and said rotor is rotatably driven by a rod extending down said wellbore from a drive mechanism located adjacent said wellhead.

9. The downhole pumping apparatus of claim 8, further including:

a pressure sensor located to detect the pressure adjacent said pump; and

a controller operatively coupled to said pressure sensor and said drive rod, to control the rotation of said drive rod in response to the pressure at said pump.

10. A method of pumping well fluids from a wellbore, comprising:
providing a cooling zone therein in the wellbore;
cooling at least a portion of the fluid in the wellbore; and
positioning a pump in said wellbore in that portion of the fluid that is cooled in the wellbore.

11. The method of claim 10, wherein the well fluid has a second material dissolved therein, and the second material vaporizes in the cooling zone.

12. The method of claim 11, wherein the second material is steam.

13. The method of claim 12, wherein the steam vapor evolves in the cooling zone, and the evolution cools the well fluid in the bore at and adjacent to the cooling zone.

14. The method of claim 13, wherein the pump is a progressive cavity pump having components therein having low resistance to temperature-based breakdown.

15. The method of claim 13, wherein the wellbore includes a footed portion having an upper surface and a lower surface separated by a wellbore span;

the pump has a width smaller than the span; and

the pump is positioned in the footed portion of the borehole to provide a gap between the pump and the borehole upper surface.

16. The method of claim 15, wherein the steam, upon vaporization thereof, forms bubbles in the well fluid in the footed bore; and,

the bubbles pass in the well fluid in the direction of the well head through the gap between the pump and the upper surface of the footed wellbore.

17. The method of claim 10, further including the steps of;

establishing a pressure range for the operation of the pump;

monitoring the pressure present at the pump;

directing the pumping rate of the pump in response to the pressure at the pump.

18. A wellbore, comprising;

a generally vertical section extending from a well head location and into the earth;

a footed wellbore section extending from said vertical section and having an entry section transitioning said footed wellbore section from the vertical profile of the vertical section to a footed section having a substantial horizontal component, the intersection region of said transition section and said footed section forming a heel location;

well fluids located in said footed wellbore;

a pump located in said wellbore adjacent said heel location; and

a cooling zone located in said footed wellbore.

19. The wellbore of claim 18, wherein said well fluid contains dissolved material therein, and said dissolved material vaporizes in said cooling zone.

20. The wellbore of claim 19, wherein said dissolved material is steam.

21. The wellbore of claim 19, wherein said footed wellbore includes opposed upper and lower surfaces separated by a bore span dimension; and

said pump has a width which is smaller than said span dimension.

22. The borehole of claim 21, wherein said pump is positioned adjacent said lower surface of said heel thereby providing a gas vent space between said pump and said upper surface of said footed borehole.

23. The borehole of claim 21, wherein said cooling zone is located intermediate said pump location and the terminus of said footed portion of said borehole in the earth.

24. The borehole of claim 23, further including a drive rod extending within said borehole and connected to said pump to mechanically drive said pump.

25. The borehole of claim 23, further including a tube extending inwardly of the borehole and connected to the fluid outlet of the pump.